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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,214	11/14/2003	Joseph John Sumakeris	5308-223CT	2561
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MYERS BIGEL SIBLEY & SAJOVEC				
PO BOX 37428				
RALEIGH, NC 27627				
EXAMINER				
DHINGRA, RAKESH KUMAR				
ART UNIT		PAPER NUMBER		
1763				

DATE MAILED: 11/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/714,214	SUMAKERIS ET AL.	
	Examiner	Art Unit	
	Rakesh K. Dhingra	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings were objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Figure 2 – reference number 156 is not shown in drawing as mentioned on page 5, line 16 of specification;

Figure 2 – reference number 112 is not shown in drawing as mentioned on page 5, line 17 of specification;

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection as explained hereunder.

New reference (US Patent No. 6,709,520 – Leycuras) has been found that reads on limitations of claims 1, 2. Accordingly claims 1 and 2 have been rejected under 35 USC 102 (b) as explained below. Further, claims 3-12 have also been rejected under 35 USC 103 (a) as explained below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 & 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Leycuras (US Patent No. 6,709,520).

Regarding Claim 1: Leycuras teaches an apparatus (Figures 1-5) that includes a housing assembly for an induction heating device, the housing assembly defining a processing chamber 2 and comprising:

a) a duct (susceptor) 6 surrounding at least a portion of the processing chamber; and
b) a secondary duct (thermally conductive liner) 70 interposed between the duct (susceptor) 6 and the processing chamber, wherein the secondary duct (liner) 70 is separately formed from the duct (susceptor) 6;

c) wherein the secondary duct (liner) 70 is removable from the susceptor without requiring disassembly of the duct (susceptor) 6 (column 3, line 30- column 7, line 25 and column 8, line 62 to column 10, line 5).

Regarding Claim 2: Leycuras teaches that apparatus comprises:

lower and upper walls (a first susceptor portion and a second susceptor portion) 37, 38 disposed on opposed sides of the processing chamber;

a secondary duct (first liner) 70 disposed between the first susceptor portion and the processing chamber; and

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another secondary duct (second liner) 70 disposed between the second susceptor portion and the processing chamber (Figure 5 and column 9, line 62 to column 10, line 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 8, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leycuras (US Patent No. 6,709,520) in view of Berkman et al (US Patent No. 3,845,738).

Regarding Claim 3: Leycuras teaches all limitations of the claim (as explained above under claim 1) including that the duct (susceptor) 6 includes a platter region (portion underlying the substrate holder 29) and a substrate holder (platter) 29 adapted to support the wafer 10 and overlying the platter region (Figure 1).

Leycuras does not teach an opening in the liner and overlying the platter region.

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Berkman et al teach an apparatus (Figure 3) that includes a susceptor 72 with a shield (liner) 74 and wherein the shield (liner) 74 has plurality of openings 80, 82 that lie over a platter region (portion lying within the openings) of susceptor 72 (column 4, lines 13-45).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a liner with opening as taught by Berkman et al in the apparatus of Leycuras to enable accommodate wafers surrounded by the heat shield (liner) and to minimize deposition of reaction products on the susceptor surface (column 1, lines 15-65).

Regarding Claim 8: Berkman et al teach that platter region is exposed through the openings 80, 82 in the shield (liner) [Figure 3].

Regarding Claim 9: Berkman et al teach raised portions 84, 86 (like platters) disposed within the openings 80, 82 in the shield (liner) 74 [column 4, lines 13-40].

Claims 4 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leycuras (US Patent No. 6,709,520) in view of Glass (US Patent No. 5,667,587).

Regarding Claim 4: Leycuras teaches all limitations of the claim (as explained above under claim 1) including a liner 70 that is formed separately from the susceptor.

Leycuras does not teach that liner varies in thickness along at least a portion of its length.

Glass et al teaches an apparatus (Figures 2-5) that includes a growth cavity 32 with a liner 36. Glass et al further teaches that liner 36 can have variable thickness along its length (Figure 5 and column 2, line 20 to column 3, line 30).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a liner with variable thickness as taught by Glass et al in the apparatus of Leycuras to enable obtain variable heating means in the process chamber.

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Regarding Claim 11: Leycuras teaches that liner (secondary duct) 70 is in contact with duct (susceptor) 6 (Figure 5).

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leycuras (US Patent No. 6,709,520) in view of Hölzlein (US 6,406,983).

Regarding Claims 5-7: Leycuras teaches all limitations of the claim including that duct (susceptor) 6 is made of graphite. Leycuras also teaches that inner surface of susceptor walls 37, 38 can be coated (that is, liner 70 will be disposed between the coating and processing chamber). Leycuras also teaches that duct (susceptor) can be made of refractory material [column 4, line 45 to column 5, line 25].

Leycuras does not explicitly teach that coating (second material) is made from refractory metal carbides.

Hölzlein et al teach a housing assembly (Figures 1, 2) for an induction heating device, the housing assembly defining a processing chamber and comprises a susceptor 13 and a base plate (thermally conductive liner) 17 and where the susceptor has a coating 20 of TaC (refractory metal carbide) {Column 7, lines 15-65}.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to form the susceptor having a coating of refractory metal carbide as taught by Hölzlein et al in the apparatus of Leycuras to minimize out-gassing of susceptor material molecules during operation of the apparatus (column 4, lines 45-55).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leycuras (US Patent No. 6,709,520) in view of Berkman et al (US Patent No. 3,845,738) as applied to Claim 3 and further in view of Paisley et al (US Patent No. 6,569,250).

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Regarding Claim 10: Leycuras in view of Berkman et al teaches all limitations of the claim except that platter is adapted to rotate relative to susceptor.

Paisley et al teach an apparatus (Figure 1) that includes a base portion (base of susceptor) 150 and a platter 130 that is adapted to rotate relative to susceptor base 150 (column 4, line 13 to column 6, line 5). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a platter that is adapted to rotate relative to susceptor as taught by Paisley et al in the apparatus of Leycuras in view of Berkman to improve uniformity of deposition layers (column 1, lines 25-35).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leycuras (US Patent No. 6,709,520) in view of Kordina et al (EP 0956376 which is equivalent to US Patent No. 5,695,567, Kordina et al).

Regarding Claim 12: Leycuras teaches all limitations of the claim including that liner 70 is formed from refractory material like graphite (column 5, lines 1-15).

Leycuras does not explicitly teach that liner is made from silicon carbide.

Kordina et al teach a housing assembly (Figure 5) for an heating means (induction heating device) 18, the housing assembly defining a processing chamber and comprising:

a susceptor (comprising of two lateral wall pieces 11 and 12, a top wall piece 13 and a bottom wall piece 14) surrounding at least a portion of the processing chamber; and

a thermally conductive liner (comprising of first plate 16 and second plate 17 made of SiC) interposed between the susceptor and the processing chamber wherein the liner is separately formed from the susceptor (Column 5, lines 45-67).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use liner made from silicon carbide as taught by Kordina et al in the apparatus of Leycuras as an equivalent refractory material.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Seelbach et al (US Patent No. 4,699,805) teach a CVD apparatus (Figure 1) comprising a reaction chamber 14 with a liner 13 that can be removed through the removable door 28 without disturbing end cap 22 (column 6, lines 50-60).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rakesh Dhingra



Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763